Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **River Protection**

Print Date: **3/9/2000**

Site Summary Level: **Office of River Protection**

HQ ID: **0384**

Project **RL-TW02 / Tank Safety Issue Resolution Project**

General Project Information

Project Description Narratives

Purpose, Scope, and Technical Approach:

Purpose: The purpose of this project is to provide an adequate, comprehensive, and reliable safety basis for the management and storage of waste by Tank Waste Remediation System (TWRS). This will be accomplished by developing and maintaining an integrated Authorization Basis (AB) and by resolving outstanding safety issues to ensure safe storage of waste.

The Tank Safety Issue Resolution Project was established to address hazards associated with the storage of radioactive mixed waste in the large underground storage tanks at the Hanford Site. Safety issues have been raised for single-shell tanks (SSTs), double-shell tanks (DSTs) and ancillary facilities with regard to flammable gas and organic complexants. In response to Public Law 101-510, Section 3137, "Safety Measures for Waste Tanks at Hanford Nuclear Reservation", tanks of the highest concern have been placed on the Watch List. This project develops the technical basis for closure of the Unreviewed Safety Questions (USQ), resolution of the safety issues, and removal of all tanks from the Watch List. It also supports upgrades to the Final Safety Analysis Report (FSAR), which is the authorization basis for monitoring for safe operations of the tank farms and continued safe storage of the tank contents.

Scope: Specific project scope from the Hanford Site technical baseline is provided below in terms of the systems that the project has responsibility for.

Tank Farm System

· Establish & Maintain Safety Authorization Basis: The function of the Nuclear Safety and Licensing organization is to establish and maintain a technically defensible safety authorization basis (AB) for the management and storage of waste within the Tank Farm System. This will be accomplished by establishing and maintaining an integrated AB and resolving outstanding safety issues. The current condition for this function has numerous open safety issues and unreviewed safety questions (USQ) along with a Basis for Interim Operation (BIO) as the AB. The end condition will have all waste tank storage safety issues and USQs closed, a Final Safety Analysis Report (FSAR) implemented as the AB, and a transition to disposal operations for maintenance of the AB.

This function consists of the following activities; Flammable Gas, Project Management, Organic, and Authorization Basis.

The Flammable Gas Project will conduct laboratory testing, waste characterization, and data analyses to define the flammable gas hazard in double-shell tanks (DSTs), single-shell tanks (SSTs) and ancillary facilities. This covers collecting and analyzing SST and DST flammable gas data, preparing a SST and DST flammable gas refined safety analysis and AB amendment, providing safety-related monitoring and/or mitigation equipment upgrades, and addressing the level growth USQ for Tank SY-101. Scope also includes addressing the potential hazards associated with flammable gases in the Tank Farm ancillary facilities and closing the flammable gas USQ for inactive miscellaneous underground storage tanks (IMUST), vaults, and inactive evaporators.

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **River Protection**

Print Date: **3/9/2000**

Site Summary Level: **Office of River Protection**

HQ ID: **0384**

Project **RL-TW02 / Tank Safety Issue Resolution Project**

Project Description Narratives

The Project Management Activity provides management support for establishing and maintaining a safety authorization basis and for resolving safety issues.

The Organic Project will address the potential hazards associated with the organics in Tank Farm ancillary facilities, especially IMUSTs, and closing the organic complexant USQ for these ancillary facilities.

The Authorization Basis Activity provides for the developing and maintaining of an authorization basis (AB) for the Tank Farm System. This covers updating/upgrading of the AB, maintenance of the USQ process, maintenance of the AB baseline, administration of the criticality safety program, managing of the licensing process, and approval and implementation of the Final Safety Analysis Report (FSAR).

This WBS supports the following technical baseline requirements for the Hanford clean up mission:

¸ · Tank safety issues for high priority tanks shall be resolved by September 28, 2001.

¸ · Central Plateau (200 Area) tank waste safety issues shall be resolved.

Technical Approach: The technical approach and technology initiatives for the Project to accomplish the Hanford Strategic Plan end point targets are identified below.

· Technical Approach - Tank Safety Issue Resolution Project: The activities to resolve safety issues are implemented in the following logic sequence: (1) define the associated safety issue; (2) monitor conditions of stored waste to evaluate safety; (3) identify and close any associated USQ; (4) mitigate or control conditions to ensure safe storage of waste; and (5) resolve respective safety issue.

Flammable Gas. The surface level rise USQ in Tank SY-101 is being remediated by transfer of waste to SY-102 and subsequent back dilution with water in SY-101. This project is also monitoring conditions in the other tanks and sampling ancillary facilities with flammable gas concerns in order to close the open USQ on those facilities. Refined safety analysis, selection of appropriate controls, and AB amendment changes will result in resolving the flammable gas safety issue for SSTs and DSTs allowing for safe retrieval of tank contents in the future.

Organic. This project will determine if the ancillary facilities contain unacceptable concentrations of organic chemical and evaluate conditions necessary for a condensed-phase propagating combustion. The waste will be characterized and models developed for each facility to bound its safety. The organic safety criteria will be applied to each facility, and requirements for continued safe interim storage identified. To resolve the USQ, testing of actual waste materials and development of enhanced monitoring equipment are being pursued.

Project Status in FY 2006:

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **River Protection**

Print Date: **3/9/2000**

Site Summary Level: **Office of River Protection**

HQ ID: **0384**

Project **RL-TW02 / Tank Safety Issue Resolution Project**

Project Description Narratives

Tank Farm System

· Flammable Gas: Tank SY-101 will be remediated and the surface level growth USQ will be closed. The Flammable Gas Safety Issue for all DSTs and SSTs will be resolved, the tanks will be removed from the Watch List, and the flammable gas USQ associated with ancillary facilities will be closed.

Project Management: Project Management will be ongoing to support the Authorization Basis activity.

Organic: The Organic Complexant and Organic Solvent Safety Issues for SSTs will be resolved, the tanks will be removed from the Watch List, and the organic complexant USQ associated with ancillary facilities will be closed.

High-Heat: The High-Heat Safety Issue will be resolved following removal of a portion of the tank contents and the tank will be removed from the Watch List.

Authorization Basis: The FSAR will be approved and implemented as the TWRS AB. Maintenance of the AB will be ongoing.

Criticality: The Nuclear Criticality Safety Issue will be resolved.

Technical Baseline Requirements
Tank safety issues: TPA M-40-00 will be complete.

Central Plateau: All outstanding safety issues will be resolved.

Post-2006 Project Scope:

Tank Farm System

· Flammable Gas: Complete.

Project Management: This activity is currently planned to transition to disposal operations in FY 2008.

Organic: Complete.

High-Heat: Complete.

Authorization Basis: This activity is currently planned to transition to disposal operations in FY 2008.

Project Description Narratives

Criticality: Complete.

Technical Baseline Requirements
Tank safety issues. . .: Complete.

Central Plateau. . .: Complete.

Project End State

Specific work activities to close the facilities under this Project to be performed by others at the end of this Project's mission are identified below.Tank Farm System
Work associated with facility performed by Tank Farm Operations:
Transition Tank Farm Facilities
Maintain Safe & Compliant Tank Farm System
Maintain Safe & Compliant Waste Within Tank Farm System
Work associated with facility performed by Retrieval:
Deliver Waste Feed
D&D Tank Farm Facility
Retrieve SST Waste
Work associated with facility performed by Tank Waste Characterization:
Sample and Characterize Tank Waste

Cost Baseline Comments:

Estimates supporting the Tank Waste Remediation Systems (TWRS) fiscal year (FY) 2001 Project Baseline Summaries (PBS) estimate were developed using Activity-Based Cost (ABC) estimating methodology consistent with the "Hanford Cost Estimating and Scheduling Guide," DOE/RL-97-90, Revision 0.

The TWRS (FY) 2001 PBS is a product of the development of the technical scope, schedule and cost baselines. The scope, schedule and cost baselines are interrelated and have been integrated. The Hanford Site Technical Baseline requirements have been incorporated in the TWRS Technical Baseline through development of TWRS technical specifications. Level 0 and Level 1 work logics were developed to define the activities and interfaces necessary to meet the technical requirements. For much of the TWRS work, Technical Basis Review (TBR) data packages were then prepared to decompose the Level 1 activities to a detailed, executable task level and document scope and resources necessary to complete the work. Activities and resources from the TBRs were input to Primavera (P3) to prepare the TWRS detailed baseline schedule. Pricing of the estimate was performed in P3 using standard rates and factors developed by the FDH Chief Financial Officer and approved by DOE for forward pricing purposes. The resource-

Project Description Narratives

loaded schedules are traceable to the TBR data packages. Costs generated by P3 were developed using the DOE-approved planning rates and were manually escalated using the DOE-approved escalation rates.

Due to significant variations in the current phases of the TWRS projects and available data and scope definition, many estimating techniques have been utilized in development of the cost estimate. They include definitive, parametric, analogy, trend analysis, level of effort and engineering judgement. ABC estimates for the scope of work have been prepared at the lowest level of detail practical. As expected, the level of scope definition and estimate detail is greatest for the near-term activities and less well defined in later years. Through the annual planning process and change control, the execution year and outyear estimate basis will continue to be refined, updated and validated.

The Estimate Basis is contained in numerous technical scope, schedule and cost baseline and supporting documents including TBR data packages.

Safety & Health Hazards:

Generation, retention and release of flammable gas mixtures into the dome space of the waste tanks could result in either an overpressurization of the ventilation system, or if an ignition source were present during a gas release, there could be a deflagration, or flammable gas burn. This could lead to breach of tank containment, aerosolization of radionuclide and toxic materials, and release of these materials to the environment. This release could result in exposure to the workers, public, and environmental contamination. Flammable gas tank risk sources include potentially as many as 149 SSTs, 28 DSTs and numerous ancillary tanks with potential flammable gas burn volumes ranging from a fraction of 1 cubic meter up to the bounding quantity of approximately 600 cubic meters.

Unacceptable concentrations of organic complexant salts in a dried-out condition, or the presence of organic solvent pools in the waste tanks could support either a condensed-phase propagating combustion, or solvent combustion. This could lead to breach of tank containment, aerosolization of radionuclide and toxic materials, and release of these materials to the environment. This release could result in exposure to the workers, public, and environmental contamination. Organic tank risk sources include potentially as many as 108 SSTs and numerous ancillary facilities with potential reaction quantities of a fraction of 1 cubic meter up to the bounding quantity of 25 cubic meters.

Safety & Health Work Performance:

See TW10.

PBS Comments:

The target level funding reflected in Section B.1 is different than the baseline budget contained in this PBS, and reflects reductions in scope that would be taken from this project if needed enhanced performance targets are not realized for the site to meet the overall anticipated funding level. Specific impacts in FY 1999 and their consequences would be:

C-103 Organic Layer Removal ($2,431K) - TPA Milestone M-41-00 requires tank C-103 to be interim stabilized by September 2000. This Project has concluded that there is no technical justification for removing the floating organic layer prior to interim stabilization; however, WDOE and CRS continue to request that it be done. Failure to meet TPA commitments could result in monetary fines.

Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **River Protection** Print Date: **3/9/2000**

Site Summary Level: **Office of River Protection** HQ ID: **0384**

Project **RL-TW02 / Tank Safety Issue Resolution Project**

Project Description Narratives

Ancillary Facilities Flammable Gas USQ Closure ($1,851K) - The updated Flammable Gas USQ, approved in November 1996, applies to TWRS ancillary facilities as well as the HLW tanks. Ancillary facilities include 4 DCRTs, waste transfer systems, 13 catch tanks, 8 vaults, 36 IMUSTs, and 2 evaporators. Not funding this scope would result in leaving the USQ open and leaving stringent and costly operational and administative controls in place on these facilities. Closure of the USQ on DCRTs is required for waste transfers from SSTs to DSTs; not funding this scope could cause further delays in the cleanup effort. Catch tanks and vaults are also needed for waste transfer activities. Reduction of funding would also lead to a politically unacceptable position on IMUSTs, since these tanks have an un-quantified, and in many cases, an unknown hazard. Deferral of the work may lead to a undefendable position with respect to the safety of the IMUSTs.

Scope Deferral ($517K) - A Directed Change Request to the FY 1998 MYWP deferred (1) security vulnerability assessments, and (2) authorization basis source term from FY 1998 to FY 1999 with no additional funding provided in FY 1999. The FY 1999 workscope that will be deleted or deferred as a result of this change request adding scope to FY 1999 has not yet been identified.

Baseline Validation Narrative:

This project is not validated; however, the Chemical Reactions Sub-Tanks Advisory Panel (CRS) has provided critical assessments of the safety issue resolution project since 1990. In addition, the Defense Nuclear Facilities Safety Board (DNFSB) has periodically reviewed the project and provided formal recommendations (90-7, 93-5) for resolution of tank safety issues.

General PBS Information

Project Validated? **Date Validated:**

Has Headquarters reviewed and approved project? Yes

Date Project was Added: 12/1/1997

Baseline Submission Date:

FEDPLAN Project? Yes

Drivers:	**CERCLA**	**RCRA**	**DNFSB**	**AEA**	**UMTRCA**	**State**	**DOE Orders**	**Other**
			Y				Y	Y

Project Identification Information

DOE Project Manager: J.E. Kinzer

DOE Project Manager Phone Number: 509-376-7591

DOE Project Manager Fax Number: 509-372-1215

Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **River Protection** Print Date: **3/9/2000**

Site Summary Level: **Office of River Protection** HQ ID: **0384**

Project **RL-TW02 / Tank Safety Issue Resolution Project**

General PBS Information

DOE Project Manager e-mail address: jackson_e_kinzer@rl.gov

Is this a High Visibility Project (Y/N): Y

Planning Section

Baseline Costs (in thousands of dollars)

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006
PBS Baseline (current year dollars)	194,013	17,707	211,720	34,070	33,042	30,205	27,148	19,927	35,166	30,790	9,616	9,084	8,203	8,384	8,568
PBS Baseline (constant 1999 dollars)	187,600	14,730	202,330	34,070	33,042	30,205	27,148	19,927	34,443	29,508	9,017	8,335	7,365	7,365	7,365
PBS EM Baseline (current year dollars)	194,013	17,707	211,720	34,070	33,042	30,205	27,148	19,927	35,166	30,790	9,616	9,084	8,203	8,384	8,568
PBS EM Baseline (constant 1999 dollars)	187,600	14,730	202,330	34,070	33,042	30,205	27,148	19,927	34,443	29,508	9,017	8,335	7,365	7,365	7,365

	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS Baseline (current year dollars)	8,757	8,950	0	0	0	0	0	0	0	0	0	0				
PBS Baseline (constant 1999 dollars)	7,365	7,365	0	0	0	0	0	0	0	0	0	0				
PBS EM Baseline (current year dollars)	8,757	8,950	0	0	0	0	0	0	0	0	0	0				
PBS EM Baseline (constant 1999 dollars)	7,365	7,365	0	0	0	0	0	0	0	0	0	0				

Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **River Protection** Print Date: **3/9/2000**

Site Summary Level: **Office of River Protection** HQ ID: **0384**

Project **RL-TW02 / Tank Safety Issue Resolution Project**

Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	2.10%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%

2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%				

Project Reconciliation

Project Completion Date Changes:

Previously Projected End Date of Project: 9/30/2005

Current Projected End Date of Project: 9/30/2008

Explanation of Project Completion Date Difference (if applicable):

Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):	127,079	**Actual 1997 Cost:**	33,042	**Actual 1998 Cost:**	27,148
Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars):	66,889	**Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):**			1,806
Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	68,695				

Project Cost Changes

	Cost Adjustments	Reconciliation Narratives
Cost Change Due to Scope Deletions (-):		
Cost Reductions Due to Efficiencies (-):		
Cost Associated with New Scope (+):		
Cost Growth Associated with Scope Previously Reported (+):		
Cost Reductions Due to Science & Technology Efficiencies (-):		
Subtotal:	68,695	

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **River Protection**

Print Date: **3/9/2000**

Site Summary Level: **Office of River Protection**

HQ ID: **0384**

Project **RL-TW02 / Tank Safety Issue Resolution Project**

Project Reconciliation

Additional Amount to Reconcile (+):	69,360
Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	**138,055**

Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
MITIG./RESOLVE TANK SAFETY ISSUES HIGH PRIORITY WATCH LIST TANKS	T02-01-100	9/30/2001	9/28/2001	9/30/2001	9/30/2001		Y				
RESOLVE NUCLEAR CRITICALITY SAFETY ISSUE	T02-99-102	9/30/1999	9/30/1999	9/30/1999			Y		Y		
DNFSB 93-05, 5.4.3.4.D/E/F COMPLETE	T02-99-103	9/30/1999	9/30/1999					Y			
TRANSMIT LTR COMPL OF RPT TO RESOLVE HIGH HEAT SFTY ISSUE	T02-99-100	5/31/1998	9/30/1999		12/31/1999			Y			
CONFIRM ORGANIC SAFE STORAGE CRITERIA (93-5, 5.4.3.3.B)	T02-99-101	11/30/1998	11/30/1998			11/25/1998		Y			
APPROVED FSAR MANAGE TANK WASTE (93-05, 5.4.3.1D)	T02-98-111	6/30/1997	1/29/1999		4/15/1999			Y			
Begin Tank Waste Safety Issue Resolution Project	PBS-97-002		2/28/1997								
PBS Mission Completion	PBS-MC-002		9/30/2008								
PBS Project End	PBS-PE-002		9/30/2008								

Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
MITIG./RESOLVE TANK SAFETY ISSUES HIGH PRIORITY WATCH LIST TANKS	T02-01-100										High priority Watch List tanks are those single-shell and double-shell tanks identified, in accordance with Section 3137 of Public Law 101-510, which have a serious potential for release of high-level waste due to

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **River Protection**

Print Date: **3/9/2000**

Site Summary Level: **Office of River Protection**

HQ ID: **0384**

Project **RL-TW02 / Tank Safety Issue Resolution Project**

Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
											uncontrolled increases in temperature or
RESOLVE NUCLEAR CRITICALITY SAFETY ISSUE	T02-99-102										Document closure of technical questions about the potential for a criticality within TWRS and for implementation of the TWRS Administrative Controls for criticality prevention.
DNFSB 93-05, 5.4.3.4.D/E/F COMPLETE	T02-99-103										The Organic Solvent Topical HNF-SD-WM-CN-032 will satisfy the remaining three organic solvent milestones in "Recommendation 93-5 Implementation Plan, DOE/RL-94-001, Rev. 1": These are; (1) Letter reporting adequate vent path in all single-shell tanks (
TRANSMIT LTR COMPL OF RPT TO RESOLVE HIGH HEAT SFTY ISSUE	T02-99-100										Transmit letter from FDH to RL reporting completion of technical basis (topical report) to resolve the High-Heat Safety Issue. This is DNFSB milestone 93-5.4.3.6.d in "Recommendation 93-5 Implementation Plan," DOE/RL-94-0001, Rev. 1.
CONFIRM ORGANIC SAFE STORAGE CRITERIA (93-5, 5.4.3.3.B)	T02-99-101										Letter reporting results of testing completion (using real waste samples) to confirm safe storage criteria, and organic solubility and aging effects on fuel content. If models are confirmed, an assessment of tank wastes compared to safe

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **River Protection**

Print Date: **3/9/2000**

Site Summary Level: **Office of River Protection**

HQ ID: **0384**

Project **RL-TW02 / Tank Safety Issue Resolution Project**

Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
											storage criteria
APPROVED FSAR MANAGE TANK WASTE (93-05, 5.4.3.1D)	T02-98-111										This milestone provides RL Manager approval of the Tank Waste Remediation System (TWRS) Final Safety Analysis Report (FSAR). RL approval includes issuance of a Safety Evaluation Report (SER). Contractor scope includes providing (1) expertise to both th
Begin Tank Waste Safety Issue Resolution Project	PBS-97-002			Y							Administrative input to document the start of this PBS.
PBS Mission Completion	PBS-MC-002					Y					Administrative input to document the mission completon of this PBS.
PBS Project End	PBS-PE-002				Y						Administrative input to document the project end of this PBS.